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SCIENCE NEWS LETTER

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THE WEEKLY SUMMARY OF CURRENT SCIENCE • SEPTEMBER 30, 1944

Pacific Theater

See Page 211

A SCIENCE SERVICE PUBLICATION

These Books TEACH

and are therefore useful to teachers and others who like to know things

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B-18

MILITARY SCIENCE

Jungle Warfare

The soldiers who defeat the Nazis will start fighting a different kind of war in the Pacific. Terrain and weather most important factors.

See Front Cover

➤ WHEN the war against Germany has ended, certain of General Eisenhower's men, and those who are in Italy and elsewhere, will be transferred to the Pacific theater by plane and ship to fight a different kind of war, a jungle war.

The men who have already fought in the jungles of the Philippines, Guadalcanal, Bougainville, and New Britain have learned almost everything there is to know about fighting in the tropical wilderness. These men know what it is to fight through a dark, damp, malaria-ridden swamp-forest, their feet swollen, their shoes sprouting mildew, their bug-bitten bodies caked with mud. Their experiences and problems have been radioed back to scientific laboratories in the United States, where researchers have already developed medical supplies and military materiel suited for jungle warfare. Men have been specially trained for jungle combat, and it is these men who will make the going easier for the soldiers transferred from the European theater.

Terrain and weather are the determining factors in jungle warfare. Together they limit the movement of foot troops and make the movement of tracked and wheel vehicles impossible except on roads and trails or crushed coral tracks.

The coastal shores of a typical Southwest Pacific island are often fringed with dense mangrove. Twisting mangrove roots and coral outcroppings make it difficult for units to land and continue to fight as organizations. Inland are the coconut groves and stretches of jungle that fringe the shoreline and before the foothills are reached come the meadows of kunai grass. Kunai grass is strong, coarse, and thick, standing as high as nine feet. Fighting in kunai grass is dangerous. Movements of the grass betray one's presence to enemy observers perched in trees at the edge of the jungle or flying overhead. Passage through these fields is usually accomplished at night.

Still farther inland are the razor-backed coral or volcanic ridges, rising toward the mountains. These ridges are precarious to negotiate, and they offer neither cover nor concealment.

The remainder of the island will usually be covered with very heavy jungle, in which there will be found vegetation of all types and trees of all sizes. The tangle of bush, much of which must be cut through, is particularly heavy in the valleys, but it tends to thin out as the elevation increases.

This is uncut, virgin jungle, the so-called rain forest. Trees stand as high as 100 feet, and a canopy of leaves prevents the sun from ever reaching the earth. More often than not the jungle is swampy, and always muddy. The swamps are usually about 500 yards wide, knee deep, and the muck is heavy.

Soldiers moving in from the beach, like those shown on the cover of this SCIENCE NEWS LETTER, fight in hot, blazing sun, and eventually reach the jungle where it is likely that they will fight in a torrential rainstorm. In jungle fighting it is always a problem of how long it will take to get from one point to another, not how many miles lie between the two points. A small force can expect an average progress of about a quarter of a mile an hour.

Jungle fighting is made up of many small combats in which groups, squads, parts of squads, automatic weapons, and teams strive to eject the enemy from his positions. Artillery and mortars are essential to the reduction of enemy bunkers and pillboxes. Tanks are rarely used, unless there is time for engineers to build roads over which they can be moved. Where used, tanks must be supported by foot troops. Guns like the 37-millimeter weapon cannot often be used, since these guns are not sufficiently mobile. It should be obvious that the most effective weapons for use in jungle warfare are those that can be carried on a man's back.

The most effective weapons are rifles, machine guns, light mortars, and hand grenades. There are bazookas and the newer rocket weapons. Rockets are powerful weapons, and are not heavy. Flamethrowers are effective against enemy machine-gun positions and pillboxes.

One of the most valuable weapons in jungle warfare against enemy personnel

MARINES ON GUAM—Proceeding cautiously through the jungles of Guam, these Marines are on the outlook for Jap snipers who may be perched in trees. Mud and heavy undergrowth must be conquered as well as the enemy.

in covered positions is the 81-millimeter mortar, a standard infantry weapon. It fires a seven-pound shell to ranges of more than 3,000 yards, and a heavier 11-pound shell to a range of 18,000 yards. It is a light weapon, about 150 pounds, and divides into a three-man load.

Newest Army Ordnance weapon for use against the Japs is the jungle mortar, a 60-millimeter mortar that can be carried by one man, together with a limited supply of ammunition. It is fired by a trigger and lanyard arrangement. The new mortar is based on a tree, log, or other stable object and provides rapid fire against pillboxes, machine-gun emplacements, and other enemy strongpoints.

Bulldozers and tankdozers, which are medium tanks with bulldozer blades, are also being used to spearhead infantry thrusts through the jungle. The water weasel, a motorized light cargo carrier, which can haul troops and supplies over land and water and through jungle muck that would bog down any other vehicle of similar weight, is also being used for jungle warfare.

Physical and mental conditioning are essential before a man is fit for jungle fighting. Men must be trained to be alert, to think, to act. The Japs have demonstrated in combat that they are at a serious disadvantage when confronted by an opponent who thinks and acts quickly.

Soldiers who are transferred from the European theater to the Oriental theater will be prepared for the jobs they have to do before being sent into combat.

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MEDICINE

Cancer of Windpipe

A patient with this rare malady, treated by surgery and radium, is still alive and well two years after the illness.

➤ THE CASE of a patient who has recovered from the rare condition of cancer developing on the windpipe, or trachea, is reported by Dr. Philip H. Pierson, of Stanford University School of Medicine, (*Journal, American Medical Association,* Sept. 23).

The patient was a 61-year-old man who was a lecturer. Bouts of hard coughing with some spitting of blood, extreme fatigue and weight loss were the chief symptoms for almost three years. Then he began to wheeze and his voice was reduced to a whisper, which interfered with his lecturing. He also suffered periods of intense suffocation. At this time he consulted a physician.

Dr. Pierson removed as much of the cancer as possible by an operation through a bronchoscope, a self-illuminated tube which is passed down the patient's throat. The doctor can see through this tube whether there are any foreign substances, such as accidentally swallowed safety pins, or conditions like cancer, and can remove them.

The radium was inserted in the windpipe through the bronchoscope, using a special radium holder devised by Dr. Robert E. Newell of the medical school's department of roentgenology. At the first attempt to insert this, the applicator was broken. The second time, the patient coughed it out after three and one-half hours. Then another applicator was broken. Finally, everything went well and the radium was kept in the windpipe for five hours, as planned.

The patient is now alive and well two years after treatment, walks considerable distances and lectures without any cough or shortness of breath, and has regained the lost weight.

Of special interest to scientists is the fact that the patient was given a drink of radioactive iodine to determine whether or not the cancer had arisen from thyroid gland tissue that might have been misplaced during embryonic development. Normal thyroid tissue collects radioactive iodine, just as it does ordinary iodine for manufacture of the hormone, thyroxin. No radioactivity, however, could be found in the pieces of cancer removed by bronchoscope, which ruled out the presence of normal thyroid gland.

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FORESTRY

California Forests Are As Dry As Tinder

➤ WARNING of the impending danger of forest fires has been issued to residents of the California region by the Forest Service of the U. S. Department of Agriculture.

The warning points out that in wartime people must be doubly careful to prevent fires they build from spreading, and making sure that the last spark is out before the fire is abandoned. Forest fires will aid the enemy, since the wood is needed for creating weapons of war.

In addition, residents of the area are cautioned to conserve water. Lack of rain in California this year has caused the mountain streams to run low or dry up, and the water supplies in the cities served by these mountain streams are short.

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PETROLEUM TECHNOLOGY

Better Quality Fuels

Will reduce operating costs and improve performance of airplanes. Special fuels are on the way to help win the battle of the Pacific.

➤ BETTER quality aviation fuels are now being developed that will reduce the operating cost for planes and at the same time will give improved performance. Intensive research is also being done to develop special fuels that will play a big part in winning the battle of the Pacific.

While facts and figures about these new fuels cannot be released at present, the general objectives are clearly defined.

The airlines spend several million dollars a year for fuel for their planes, and after the war, with the promise of increased flying, the cost of fuel will play an even bigger part in keeping the airline fares up. If a new aviation fuel that will give the same power on less fuel is produced commercially, your seat on a plane after the war may be less expensive.

The fuel that helped win the battle of Britain was one that obtained greater power from the same mixture of air and gas as was used prior to the war, resulting in better performances.

The big factor in the Pacific theater is range of operation. Petroleum technologists are now at work on a fuel that permits longer flights on the same amount of fuel. This fuel may help win the battle of the Pacific.

Going one step farther, science is endeavoring to create a fuel that combines the best qualities of the two fuels just mentioned, resulting not only in greater range but also in better performance, on a smaller volume of fuel.

The chief limiting factor in aviation fuel performance at present is the tendency of most fuels to knock under conditions of increased power. This is the same kind of knocking that annoys you when you "gun" your automobile motor going up a hill. Knocking in an aircraft engine is dangerous, even to the extent of destroying the engine itself.

The power output of an airplane engine when operating on the lowest weight of fuel may be limited by knocking. To obtain maximum power, it is necessary to find ways to avoid this knocking. This is done by feeding to the engine more fuel than it needs to produce a given amount of power.

Therefore, while modern aircraft fuels permit engines of greater power to be built, they use up large amounts of fuel. The B-29 has four 2,200 horsepower engines. This and other great teams of engine and fuel power our attack on Japan today. At the same time these engines still employ uneconomical amounts of fuel for take-off, climb, and high speed.

Startlingly high amounts of fuel have been needed in Europe. A single bombing mission over Berlin from bases in Britain requires up to 3,000,000 gallons of 100-octane gasoline for 1,000 heavy bombers and their escort fighter planes. This is about one-third of the reported total U.S. daily production of the high-powered aviation fuel.

The present consumption of aviation gasoline by our air forces is over 150,000,000 gallons a month in the theaters of operations only.

One squadron of 12 B-24's on a five-hour mission from the Palau Islands to bomb Mindanao might use up more than 16,000 gallons of aviation fuel.

The need for a fuel that gives greater power with lower fuel consumption becomes apparent when you look at the longer distance supplies of gasoline have to travel to get to the Pacific theater. Almost every drop of fuel used by our fighters and bombers in the South Pacific has to be carried by boat.

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ICE FREE—A new chemical de-icing lacquer for aircraft propellers that is painted or sprayed on, keeps the blades free of ice for long periods of time. Called Icelac, it is black in color and has a consistency like that of glycerine. When the substance loses its sheen, additional coats are applied. Notice that the untreated wing is iced.

PSYCHOLOGY

There Is No Such Thing as Pure, Unmotivated Thought

➤ THERE IS no such thing as pure, unmotivated thought, Prof. Gardner Murphy, of the College of the City of New York, told his colleagues in his address as president of the American Psychological Association. In thinking, he said, a person is always influenced not only by external facts but by his own needs, desires, fears and tensions.

Even scientists, he declared, need to see things in the light of the culture in which they live and to espouse views that are reputable at the time.

Not only the wish, but fear may be father to the thought. And a pattern of thinking derived from fear may be repeated and fixated. In anxiety, a person recalls that which has brought on the greatest distress.

Hope for freeing the intelligence from this inner domination of thought is seen by Prof. Murphy in man's natural curiosity.

"The curiosity impulse is one of the most powerful, one of the most difficult to assuage, that man possesses," Prof. Murphy declared.

"He needs contact with reality even more than he needs escape from it. He can develop such a craving for contact with reality as will sweep away petty personal prejudices and the smug sense of cultural rightness."

When such curiosity is socially shared as it is in the field of science, it can be especially powerful in discovering the truth—and such curiosity is highly contagious.

"Peace makers," said Prof. Murphy, "might well be concerned with the efforts of scientists to look upon the problem of world order as one which can in many respects be approached through the methods of organized scientific curiosity."

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AERONAUTICS-PHYSICS

Trailing Airspeed Bomb

Measures air pressure at speeds in excess of 300 miles an hour and eliminates one of the foremost dangers of testing planes.

► A NEW airspeed bomb that measures the air pressure at speeds in excess of 300 miles an hour eliminates one of the foremost dangers of testing planes. The new bomb makes it unnecessary to fly at extremely low altitudes over a speed course on the ground in order to check the accuracy of the airspeed instruments.

The bomb was developed by V. J. Schack, William Ehlers, and W. C. Drowne, of the Research Engineering Division of the Consolidated Vultee Aircraft Corporation. Similar devices have been experimented with from time to time. However, most of the previously designed bombs indicated airspeeds of 130 miles an hour or less.

The bomb itself looks like a metal lure used by fishermen. It is 12 inches long, with four rounded stabilizing fins about 3 inches long, and it weighs only 25 pounds. The static pressure head is attached to one end, the fins to the other. Despite its light weight, the bomb shows no tendency to whip or oscillate at high speeds.

The entire assembly has been designed so as to present minimum resistance to a smooth flow of air.

The body of the bomb is made of lead to provide maximum weight in a minimum area. The nose of the bomb is a standard static pressure head. This pressure head, or airspeed indicator, is really a sensitive pressure gauge. It shows the speed at which the plane is moving through the air, and is used by engineers testing the instruments of a new plane to determine whether the built-in pitot-static tube is operating properly.

The pitot tube must be extremely accurate, since every airplane has a certain safe flying range of speed. At the low point on this range, the plane approaches the stalling point. At the high extremity, it approaches a dangerously steep dive. The airspeed for a given engine speed is therefore an index of the fore and aft angle of the plane.

Since it is impossible to obtain true static pressure indications in the turbulent air close to a plane in flight, the new bomb is attached to a cable and lowered by means of a winch to a suitable distance from the plane. Either side hatches or belly hatches of the modern bomber can be used to launch the instrument.

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PHYSICS

Identification Aid

► SHADOWS throw light on identification from the air of many man-made structures, photo interpreters of the U. S. Navy report. Tall, slender objects, such as smoke stacks, water towers, storage tanks, radio and radar antennae frequently would be indistinguishable but for their shadows, say the men who study Navy photo-reconnaissance pictures for information that is of value in planning bombing raids against the Axis.

Shadow lengths give a measure of relative height. Actual height of a building, or a tower, or a boat, can be determined by comparison with the shadow cast by an object whose height is known. However, it is necessary to have the shadows to be compared made under identical conditions. Usually two shadows in the same picture are used for comparison when the height of the object making one shadow is known or can be determined.

Seen from an airplane, in full sunshine, a natural shadow is almost always the blackest thing on earth. Dummy or faked shadows, made by painting a shadow on the gound to deceive Allied airmen, will look lighter in photographs.

These dummy shadows can also be picked out in photos because they do not change with the sun, and appear the same in all pictures, regardless of the time of day the photographs were taken. A shadow may be a clue to some strategic enemy radio station; or it may be a deciding factor in identifying a ship or a plane. It may provide valuable profile information in reconstructing measured drawings or models of ships or planes.

The absence of shadows may indicate fake planes painted on a runway or parking strip, when observed through a stereo viewer.

A knowledge of shadows is important, says the Navy, in camouflage work. Objects in the shadow of other objects are likely to be overlooked by enemy aircraft. The confusing shadow of a clump of palm trees or a hedge is often used to hide important materiel from the eyes of the enemy.

The "shadowgraph," latest training aid for Naval Airmen provides perfect silhouettes of planes and ships for recognition training. Operated on the principle of a Japanese shadow play, the equipment consists of a translucent screen, a light projector and a mirror.

The projector is positioned so that rays strike the mirror and are reflected horizontally to the screen, producing a perfect silhouette of any object placed between the screen and the mirror.

The shadowgraph can be used without darkening the room.

The instructor, standing behind the screen, manipulates the models of planes and ships, pointing out recognition features or calling for identification.

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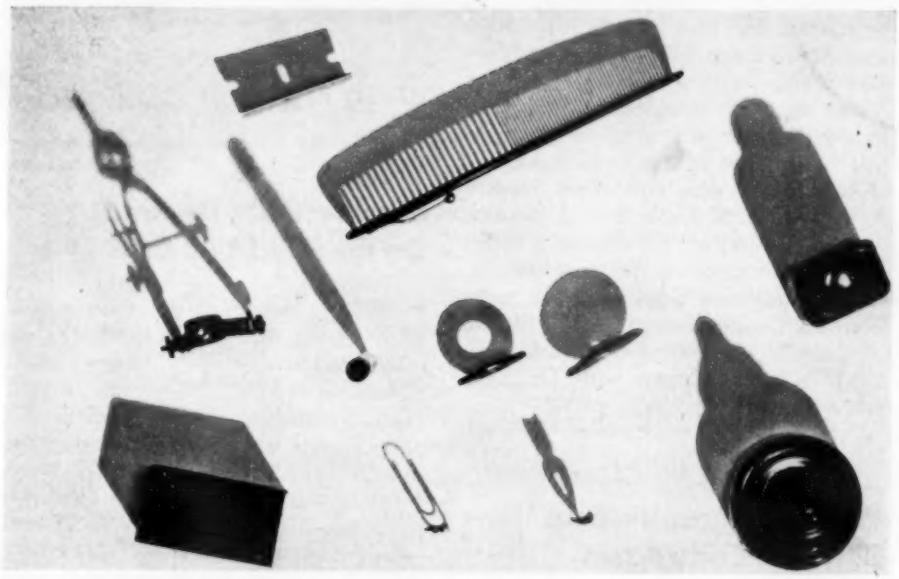
Swedish private homes are caring for 45,000 *children* from Finland.

PERFECT SILHOUETTE — The clear shadow given by the Shadowgraph, is an aid in training Navy men to identify aircraft. Light from the projector is reflected horizontally from the mirror to the screen.



SHADOW PUZZLE—Place a piece of paper over the shadow of each of the objects shown in the above picture and see how many you could identify without the aid of the shadow. Shadows, Navy men are taught, are important in penetrating camouflage.

MEDICINE

Blots Test Alcoholics

By revealing their inner feelings and attitudes, test enables physicians to plan treatment more effectively. Six groups may be distinguished by the test.

➤ WHETHER or not he sees pink elephants, the things an alcoholic sees in a set of ink blots can be a big help to the doctor treating him, it appears from studies reported by Miss Victoria Cranford, of the Haarlem Lodge Sanatorium staff at Catonsville, Md., to the Institute on Alcoholism, meeting in Baltimore.

The Institute is not for patients but for educating persons who have to deal with alcoholics, from doctors to clergy and probation officers, on the medical aspects of alcoholism.

The ink blot tests, designed by a Swiss psychiatrist, Hermann Rorschach, for whom they are named, reveal the inner feelings and attitudes of the alcoholic, feelings he may not know he had, but which make up the real reason why he cannot control his drinking and becomes an alcoholic. The test was originally devised for diagnosing personality disorders such as result in mental disease. Alcoholism is also the result of a personality disorder.

In general, six groups of alcoholics may be distinguished by the Rorschach test, Miss Cranford said. These six are the psychotic, the neurotic, the feeble-minded, the constitutionally inadequate, those who drink to deaden physical or mental pain, and those who "developed from social into abnormal anti-social drinkers as a result of habit, plus time, plus body changes and the strains of life."

Treatment, she said, has to be planned according to why the patient drinks as well as according to financial and family circumstances.

Hardest of all alcoholics to treat successfully is the business-man executive type. As a group, this kind of alcoholic is "nearly hopeless," Miss Cranford said.

"As a person," she finds, "he invariably has the little dictator attitude, characteristic of the nursery darling, and his button-punching, telephone-banging, take-a-letter-Miss-Simpson habits make him especially inaccessible to plain folks and practical living."

In spite of his bluster and brag, he feels deeply insecure and develops a drinking problem as a continued "padding" and "bolstering" of his own unadmitted feelings of inadequacy and lack of confidence. The Rorschach test is especially valuable for this type of alcoholic, because it enables the doctor to get to the patient's vulnerable points rapidly so that at least a beginning of appropriate treatment can be made before the patient gets impatient and dismisses the doctor.

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ELECTRONICS

Airport Vision Will Be Better After War

➤ INDICATION that after the war regular airline operations will not be interrupted by fog, rain, snow or other weather conditions which contribute to poor visibility was presented by Maj. Wilbur T. Harding, Assistant Chief of the Electrical Branch, Air Corps Equipment Laboratory, Wright Field, at the meeting of the Illuminating Engineering Society in Chicago.

A preview of the well-dressed airport of the future was given in Army-Navy tests at a Naval Air Station in Newfoundland, where conditions of poor visibility prevail, Maj. Harding reported.

Brilliant, high-powered "approach lights" were set up along the runways of the Newfoundland airport. Until now, these lights have been used only to mark the end of the landing strip. At great personal risk, Maj. Harding stated, Army and Navy flyers conducted tests using the new lights, making landings with extremely low ceilings and with the fog "boiling" out of the ground obscuring the runway.

Flying into the airport under these low visibility conditions, using radio aids for the approach, pilots found that the approach lights gave definite aid and allowed last-minute correction necessary for safe landings. Without the lighting aid, safe landings would have been impossible, Maj. Harding reported.

Radio approach and lighting systems in use today cannot always be depended upon to lead a plane onto a narrow runway for a safe landing. Maj. Harding called for the improvement of radio and lighting systems that will allow safe landings to be made at any airport, under any weather conditions, day or night. The two aids will be correlated, he said.

"After the war, commercial aviation will flourish as never before. The public will demand regularity of operations. Safety of operations will be demanded and must be furnished along with regularity," Maj. Harding pointed out.

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ENGINEERING

Gas Turbine Warplanes Are Already in the Air

➤ GAS TURBINE-powered warplanes are already in the air, thanks to the discovery that certain alloys, added to steel, provide a material able to withstand the very high temperatures at which such engines must operate for efficiency.

Discovery of these alloys, which he called "vitamin alloys," was disclosed by Fred K. Fischer, an engineer of the Westinghouse Electric and Manufacturing Company at the meeting of Western Massachusetts Engineering Society, in Springfield. All early attempts at development of successful rotary gas engines have failed, he said, because the science of metallurgy has never until now been able to provide the materials to stand these high temperatures.

"It is only with the recent discovery of the formula for adding the 'vitamins' to steel, a formula to which many men and many laboratories have contributed, that this difficulty has been overcome," he stated.

"Censorship will not permit the actual 'recipe' of the new steels to be disclosed," he added, "but it does permit the disclosure that the combination of elements used is tungsten, molybdenum, columbium and titanium. These are used with such bases as nickel, cobalt and chromium. It is the proportionate quantities of all these that is secret."

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PSYCHIATRY

NP Discharged Soldiers Not Getting Needed Care

➤ MEN REJECTED or discharged by the Army for neuropsychiatric reasons are many of them in need of psychiatric treatment or advice, but only a very small proportion are able to get this help, a study by the New York City Committee on Mental Hygiene of a typical group of men in that city shows.

The group studied included 314 men rejected by the Army and 309 who were discharged. Of these 623, about 80%, or 492, were found to be in need of some form of psychiatric help. About 25%, 123, realized themselves that they needed help and wanted it. But only 25 men were actually getting it. This shows that facilities for this sort of care are totally inadequate even in New York City.

The total number of men discharged or rejected for neuropsychiatric reasons amounts to about 135,500 in New York City alone.

The survey is considered by the committee to have national as well as local significance, and the report has been submitted to the War and Navy Departments, the U. S. Public Health Service, National Selective Service, and other agencies interested in this problem.

The study was made under a grant from the Commonwealth Fund and was conducted by a committee on psychiatric needs in rehabilitation, with Dr. Lawrence S. Kubie as chairman.

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ANTHROPOLOGY

Wide Geographic Gap Between Early Races

➤ A STRANGE and very wide geographic gap exists in the distribution of the earliest known races of man, Prof. Fay-Cooper Cole of the University of Chicago pointed out in his address as retiring vice president of the American Association for the Advancement of Science's section on anthropology.

Some scores of thousands of years ago during the last great Ice Age, Pithecanthropus appeared in Java and Sinanthropos in China. At approximately the same time Heidelberg man appeared in Germany and two ancient (and still-disputed) human types in England. But in the whole vast continental stretch between northwestern Europe and southeastern Asia no human remains of comparable age have yet been found.

Prof. Cole also cast some doubt on the claim of Africa to title as cradle of the negro race. There are some indications, he stated, that negroes may have originated in northern India and that their occupation of Africa may be of relatively recent date, in terms of evolutionary time.

Science News Letter, September 30, 1944

GENERAL SCIENCE

Speaking for an Audience Aids Memory of Speaker

➤ TELLING a story before an audience, a speaker remembers more details, puts in more interesting description and makes more effort to clarify and elaborate difficult ideas than he does in talking to an individual, Dr. Nelson G. Hanawalt and Katharine Ford Ruttiger found in a study made at the New Jersey College for Women, Rutgers University.

Science News Letter, September 30, 1944

IN SCIEN

NUTRITION

Brain Activity Depends On the Food You Eat

➤ "WHAT you think about depends on what you eat and not on the books you read," declared Dr. T. C. Barnes of the Hahnemann Medical College, Philadelphia, in the course of a paper on the physiological basis for the electrical activity of the brain.

Brain waves, the rhythmic electrical pulsations that can be measured by sufficiently delicate detecting instruments through skin and scalp, are greatly influenced by the concentration of sugar in the blood, Dr. Barnes found. These waves, he explained, are produced by a complex chemical known as acetylcholine, which requires sugar and carbon dioxide for its build-up.

Science News Letter, September 30, 1944

AERONAUTICS

System Keeps Oil Flowing Freely at 45,000 Feet

➤ A NEW lubrication system that assures perfect flow of oil at altitudes up to 45,000 feet will enable Army and Navy planes to fly higher than any known Axis aircraft, Dr. P. H. Schweitzer, professor of engineering research at Pennsylvania State College, and A. P. Sharples, president of the Sharples Company, Philadelphia, told a meeting of airplane engine manufacturers, lubrication experts, and representatives of the Army and Navy.

Ordinary lubrication systems fail because of low barometric pressures encountered at high altitudes, the authors stated. The new system gets around this through the use of a scavenger pump, ordinarily used to carry excess oil from the engine back to the oil tank, as a booster. When the oil pressure begins to get low, the scavenger pump supplies enough mixture of air and oil to permit efficient operation of the engine.

The design of the new system, known as the S-S Lubrication System, permits the location of the oil tanks at any point on the plane, they said.

It is probable that the new system will be used after the war for commercial flying in the stratosphere.

Science News Letter, September 30, 1944

E FIELDS

ORDNANCE

New Incendiary Bullet Penetrates Gasoline Tank

➤ A NEW armor-piercing incendiary bullet is now being used by American gunners on all battlefronts as an offensive weapon to penetrate enemy gasoline tanks and ignite the explosive vapors, the War Department announced.

The .50 caliber incendiary bullet explodes inside the pierced tank. It was developed by research under the direction of the U. S. Army Ordnance Department. The bullet has been kept secret for about a year.

Even a self-sealing gasoline tank with protective armor can be blown up with the new bullet. It is now in mass production and has been supplied in large quantities to Army Air Forces and other air groups in Europe and the Southwest Pacific.

Science News Letter, September 30, 1944

CHEMISTRY

Stream Pollution Abated At Reasonable Cost

➤ ABATEMENT of stream pollution from factory wastes can be successfully carried out at a cost commensurate with the accruing benefits, declared William S. Wise, chief engineer, Connecticut State Water Commission, speaking at the meeting of the American Chemical Society in New York.

"The economic loss resulting from stream pollution is a real one and of considerable magnitude, even though it cannot readily be evaluated on a monetary basis," he said.

Stream pollution abatement problems in general are made up of a number of complex and intangible factors, such as stream size and characteristics, character and volume of wastes, natural laws and self-purification, local conditions and needs, and the uses made of water courses. The development of successful waste treatment processes depends upon a thorough knowledge of their composition and reaction, Mr. Wise added.

It is physically possible for manufacturers, he said, "to carry treatment of practically all industrial wastes by a process or combination of processes to a degree of purity which would permit their discharge into almost any water course."

There is an economic balance determining for what purposes a stream can or should be used, the speaker continued. "Reasonable classification of all waterways in a state or region, designed to restore and maintain them in a state of purity economically feasible, provides a foundation upon which a pollution abatement program can be developed," he added.

Science News Letter, September 30, 1944

MEDICINE

T. B. Death Rate Declines Slightly During 1943

➤ THE TUBERCULOSIS death rate declined slightly throughout the nation during 1943, the National Tuberculosis Association has announced on the basis of provisional reports from state health departments.

Total number of tuberculosis deaths for the year were 56,178, with 118,042 new cases reported. The 1943 death rate was 41.9 per 100,000 population, compared with 43.1 in 1942.

An increase in deaths generally was noted, however, in reports from highly industrial states.

Despite the decrease for the nation as a whole, the downward trend in tuberculosis deaths has slowed, Dr. Kendall Emerson, managing director of the association said, warning that every precaution will be needed to prevent a wartime increase.

Science News Letter, September 30, 1944

INVENTION

Soft, Spongy Cushion Made From Hair and Bristles

➤ A CUSHION for airplane pilots and bombardiers made from cattle hair, pigs' bristles, and reclaimed rubber was one of the features of the Firestone Tire and Rubber Company's war industries exhibit in New York.

Other items shown include an anti-aircraft gun, a barrage balloon, an autogiro, the world's largest and smallest tires, giant military pontoons, pneumatic rafts and life belts, bullet-sealing gasoline tanks, automobile tires that can run after being torn by bullets, plastic jungle screening that retains its shape even if a pencil is pushed through it, and hundreds of other products created from rubber, metals, and plastics.

Science News Letter, September 30, 1944

ZOOLOGY

Rat Population Averages 77 Per City Block

➤ THE PIED PIPER, if he should return today to one of our modern Hamelin Towns, would have to exchange his pipe for an adding machine: rat extermination has gone statistical.

At the meeting of the American Association for the Advancement of Science, Dr. John T. Emlen, Jr., of the Johns Hopkins Hospital told how a rat census was taken in 89 city blocks in Baltimore during intensive extermination campaigns. Box traps were used until about 90% of the rats in a block had been taken, and the remnant was then wiped out with gas and poison bait.

Rat populations of individual blocks varied. They ranged from none at all to 200 per acre, with an average of 20 per acre or 77 per city block.

Science News Letter, September 30, 1944

ASTRONOMY

Fireball's Path Traced To Indiana-Ohio Border

➤ THE GREAT fire-ball of Aug. 18 that streaked across Indiana and Ohio in daylight has had its path traced, thanks to about 150 reports sent in by readers of newspapers served by Science Service.

Dr. Charles P. Olivier, director of the Flower Observatory in Pennsylvania, and president of the American Meteor Society, has traced the fireball's path back to near the Indiana-Ohio border southeast of Portland, Ind.

The meteor exploded over Wabash County, Ill., at a height of 10 to 20 miles. Fragments seem to have gone considerably farther, Dr. Olivier finds, and meteorites or "stones from heaven" should be sought in that region.

Loud sound effects are reported from many places. A smoke train, along the latter part of the path, lasted fully 10 minutes and drifted southward.

Anyone in southeastern Illinois who saw the object in the sky about 8:15 a.m. CWT on Aug. 18 who has not yet reported his observation is urged by Dr. Olivier to do so in order that more accurate and complete heights and orbit can be determined.

The height and rate of drift of the smoke train are of great value to scientists since this information will give facts about the upper atmosphere that can be obtained in no other way.

Science News Letter, September 30, 1944

ASTRONOMY

Venus, Evening Star

Saturn and Jupiter are the only other planets now visible during the night. The stars are the main spectacle during October.

By JAMES STOKLEY

➤ ONCE AGAIN we are beginning to have a bright evening star. After the sun has set, look to the southwest as the sky darkens and, if it is clear, you should be rewarded by seeing a brilliant point of light which is the planet Venus. This month it sets about an hour and a quarter after the sun but it is gradually moving eastward through the sky. So is the sun, for that matter, but Venus is going more rapidly. This means that it is drawing away from the sun, and so it remains visible each night a little longer after the sun has gone down. During the coming winter it will be easily visible even after the sky is completely dark.

Because Venus sets so early, it does not appear on the accompanying maps. These show the appearance of the skies, in your local standard war time, at about 11:00 p.m. on Oct. 1, and about 10:00 p.m. on the 15th. There is another planet visible in the evenings this month, but it too fails to get on the map, this time because it rises too late.

Around midnight, if you look to the northeast, you will see the constellation of Gemini, the twins, rising. In this group, besides the two bright stars, Castor and Pollux, there will be a third brilliant object, though not nearly equal to Venus. This is the planet Saturn. It moves rather slowly through the sky, but each month rises about two hours earlier than the previous month so it also is coming into the early evening skies.

Jupiter Visible

The only other planet now visible during the night is Jupiter, which comes up about three hours before the sun, and is some 30 degrees above the southeastern horizon at sunrise. Because of the same effect of rising earlier each month, this too will be in the evening skies during the winter, so we are promised a rather good planetary display at that time.

That leaves the stars themselves as the main spectacle during these October evenings. Most brilliant of them is Vega, in Lyra, the lyre, which is high in the west. Directly above it is Cygnus, the swan, with first magnitude Deneb. To the left of Vega is Aquila, the eagle, in which Altair is found. Looking toward the east, we find Taurus, the bull, near the horizon, and in this red Aldebaran is visible. Just to the left of Taurus is Auriga, the charioteer, and in this there is the star Capella, second brightest of those mentioned. Finally, low in the south, is Fomalhaut, in Piscis Austrinus, the southern fish.

High in the south are some characteristic star groups which, though they contain no first magnitude stars, one should know. There are the four stars making up the "great square" of Pegasus, the winged horse. Branching off from the northeast corner of the square is Andromeda, the chained princess, while below and to the east of the square is the figure of Pisces, the fishes. Then, right above Auriga, between him and Andromeda, is Perseus, the mythological hero who rescued Andromeda just as she was about to be devoured by a great sea monster. The monster is represented by Cetus, the whale, just below the fishes.

Others Are Faint

In addition to the planets already mentioned, there are others in the sky, but these are too faint to be seen except with a telescope. Uranus, next planet out beyond Saturn, is in Taurus. Neptune, next beyond Saturn, is in Virgo, the virgin, the group in whose direction the sun now stands. And Pluto, the farthest of all, is in Cancer, the crab, which rises in the early morning, so is not on maps.

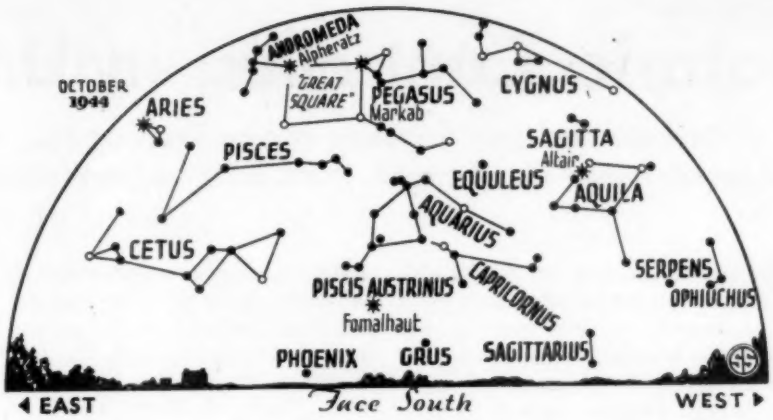
However, there most likely are other "planets" in the sky, which no telescope will show. Of course, there are probably some faint members of our own solar system, even beyond Pluto, which have not yet been discovered, and which may be revealed by future work. But in the constellation of Cygnus there is a body which is probably of planetary nature, and which is not part of our solar system.

Search for Other Planets

For years, men have realized that our sun is a fairly typical star in most respects, except for the fact that it is surrounded by a family of planets. Why, then, could not other stars have similar planets revolving around them? The difficulties of finding such planets are enormous, for with no light of their own, standing close to a bright glowing orb, no present-day telescope could reveal any of our planets to an astronomer, for instance, on a planet revolving around Sirius, which is one of the closest stars.

Fortunately, there are indirect means of detecting objects in the heavens. Both Neptune and Pluto produced effects on other planets which made it possible for astronomers to know that they were there even before they saw them. Years ago, astronomers found that Sirius, the dog-star, was moving in a wavy sort of path, as if it were pulled first one way, then the other. They realized that some undiscovered body was producing such a pull, and later it was discovered. Though much fainter than Sirius, it is a star, and the two revolve around each other.

Up in the constellation of Cygnus, a



✲ ✱ ○ ● SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS

short distance away from Deneb, in the direction toward Pegasus, is a star known as 61 Cygni. It is just about bright enough to be seen with the naked eye on a dark night. This was the first star to have its distance measured, in 1838, by F. W. Bessel, who found that it is about 11 light years away. That is, its light, traveling eleven million miles a minute, takes almost eleven years to reach us. It is thus one of the closest of all stars. It also is a double star. That is, like Sirius, there are two bodies revolving around their center of gravity, but in this case they are nearly of the same brightness.

Found By Mathematics

In studying very accurate photographs of these two stars, Dr. K. Aa. Strand, a Danish astronomer working at the Sproul Observatory, Swarthmore, Pa., found that the movement of one of them was irregular, and decided that there must be a third body revolving around it. By a mathematical analysis, he calculated that it was only about a sixtieth of the sun's mass, and that it goes around its parent star in about 4.9 years.

The least massive star known up to this time was only about a seventh of the sun's, so that the new body is far below a star in mass, and could hardly be classed as stellar. It is only 16 times as massive as the planet Jupiter so Dr. Strand decided that it is a planet rather than a star. This is the first planet, if such it be, to be discovered outside our solar system. Since then other stars have been found to have similar small companions, so it looks as if our planetary family may not be unique, as some have imagined.

In the course of his work, Dr. Strånd made some calculations about the two main stars of the 61 Cygni system. He found that their combined mass is slightly more than the sun's; that they make a complete revolution in 720 years and that they are of the order of 7,000,000,000 miles apart.

Although the presence of the 61 Cygni planet is known as definitely as if it were visible, there is little hope at present for seeing it through telescopes, and even less for finding out anything about its physical nature, much less whether it has any inhabitants. But at least it is a step toward making us less lonely in the universe, for as we look at the constellation of Cygnus we can realize that there at least is another body which is something like the planets around the sun, one of which is our home.

Celestial Time Table for October

Oct.	EWT		
1	1:00 p.m.	Moon nearest, dist.	222,000 miles
2	12:22 a.m.	Full moon	
8	11:42 a.m.	Moon passes Saturn	
	9:12 p.m.	Moon in last quarter	
10	12:49 a.m.	Algol at minimum	
12	9:38 p.m.	Algol at minimum	
13	8:54 p.m.	Moon passes Jupiter	
14	10:00 a.m.	Moon farthest, dist.	252,400 miles
15	6:27 p.m.	Algol at minimum	
17	1:35 a.m.	New moon	
19	3:40 p.m.	Moon passes Venus	
22		Meteors of Orionid shower visible	
24	6:48 p.m.	Moon in first quarter	
29	10:00 p.m.	Moon nearest, dist.	223,800 miles
30	2:31 a.m.	Algol at minimum	
31	9:35 a.m.	Full moon	

Subtract one hour for CWT, two hours for MWT, and three for PWT.

Science News Letter, September 30, 1944

ENGINEERING

Engine Testing Unit Studies 100-Octane Gas

➤ A ROARING airplane engine which could pull a plane through the air as fast as 400 miles an hour, but which will never leave the ground is the center of a new aviation fuels testing unit revealed by the Standard Oil Company (New Jersey). It is expected that with the new $500,000 unit, petroleum technologists will be able to speed up the improvement of the 100-octane gasoline now used by the Allied air forces and possibly increase the production of this super-fuel.

Engines exceeding 2,500 horsepower can be operated on the new test stand, the first of its kind built.

The petroleum technologists will study, primarily, the problem of aviation engine knock, the same kind of knock that you hear in the engine of your automobile if the octane rating of the gasoline you are using is too low. In your car, the knock only causes annoyance and steals power from you, but it threatens the aviation engine with destruction in a few seconds.

While the need for anti-knock quality in gasoline for airplanes greatly exceeds the demands of automobile engines, the fuel improvements resulting from the operation of the new testing unit may ultimately make possible the increased power and better performance that car drivers will enjoy.

Flight conditions are simulated by huge blowers which supply air at any desired pressure or temperature within the range experienced at various altitudes.

The operation of the test stand is automatically controlled in an adjoining instrument room which is protected from the intense sound in the test stand room by a 16-inch concrete wall in which there are no doors. For observation, the operators use three windows in the wall, each of which has four panes of glass of varying thickness to minimize sound transmission.

Science News Letter, September 30, 1944

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Do You Know?

Makhorka is a kind of coarse tobacco raised and used extensively in Russia.

Plastic fifes and bugles make marching music and chow-calls in the Army.

Attic insects, such as cluster or honey flies, wasps and elm tree beetles, can be controlled with a pyrethrum spray.

Chlorine dioxide, first used to bleach flour less than two decades ago, is now used to bleach starch, paper, soap and textiles.

Enough *barium salts* will soon be mined and produced in Brazil to meet local needs; barites are used in paint pigments.

By agreement between the two countries the United States will buy all *pyrethrum flowers* grown in Brazil not needed for domestic insecticides.

An average of 500 pounds of *water* is sucked from the soil by the roots of plants and passed through the plants to produce one pound, dry weight, of growth.

Farm accidents in the United States take about 20,000 lives a year and injure some 2,000,000 others; farm machinery, livestock, slips and falls are the principal causes.

Gur is a crude type of unrefined brown sugar produced in India; it contains about two-thirds as much sucrose as factory white sugar but is used in large quantities because of its lower cost.

Thirty-seven of the 48 states are served with *natural gas* having nearly 9,000,000 customers; nearly 11,000,000 other customers in the United States were served with manufactured and mixed gas.

Ultra-pure fine *iron* rod, 99.99% pure, obtained by electrolysis and then by cooking in hydrogen in a high-frequency radio-wave furnace, is used for comparative purposes in the spectrographic examination of commercial iron.

A special medical committee has been appointed by the Swedish government to study the ill effects resulting from the use of wood and charcoal *producer gas* units in motor vehicles; the gas is a substitute for gasoline.

MEDICINE-METALLURGY

Malaria Controlled in U.S.

Dreaded as scourge when camps first opened, now considered minor ill on home front. Still a challenge in tropics.

➤ MALARIA, dreaded as a potential scourge when Army encampments were first established in this country, has turned out to be only a minor home front trouble, Maj. O. R. McCoy, M. C., director of the Tropical Disease Control Division, Office of the Surgeon General, told the meeting of the American Association for the Advancement of Science in Cleveland.

Malaria rates on military reservations have consistently remained below peacetime levels, and in 1943 the figure dropped to a record low of only two cases per 10,000 troops stationed in the continental United States. Major McCoy credited this remarkable showing primarily to the ten-million-dollar campaign against mosquito breeding places which the Army has waged incessantly for the past three years.

In addition to the customary measures of drainage and oiling, heavy use has been made of larvicides to kill the "wigglers." The sensational insecticide, DDT, has proved the best killer for larvae as well as adult mosquitoes, and it is now available in quantity for military uses. Major McCoy also had high praise for the aerosol "bomb" method of attack on mosquitoes.

For meeting the malaria menace in the tropics, complete suppression of mosquito breeding is impossible, and reliance must be placed partly on personal defenses such as nets and repellents, partly on antimalarial drugs. For the latter purpose, the speaker stated, atabrine has now been found on the whole more satisfactory than quinine. Neither atabrine nor quinine, however, is completely satisfactory, and the search for the final answer to the malaria germ's challenge still goes on.

Science News Letter, September 30, 1944

Treasure at Rainbow's End

➤ TREASURE-TROVE at the rainbow's end is not just a romantic dream to scientists. The special kind of rainbow made by splitting the light from minerals heated to incandescence and analyzed in the spectrograph, to find out what metals they contain and how much of each, can serve as a guide in our search for new ore-bodies from which to feed our smelters when present beds of high-grade ores have been worked out, Dr. Lester W. Strock of the Saratoga Springs Commission, State of New York, told the American Association for the Advancement of Science.

War demands, Dr. Strock emphasized, "have not created a new problem of a dwindling ore supply, but merely accelerated a trend already well established and aroused more interest in the inevitable end-result inherent in ore mining. . . . To continue living in a Metal Age, new raw materials for metals must be discovered and utilized. These will be large-scale deposits of mineralized rocks, of too low grade and too complex for use by existing plants and current economic practices."

Science News Letter, September 30, 1944

ARCHEOLOGY

Food for Egyptian Mummies Still in Good Condition

➤ BREAD from the funeral feasts that were put into the tombs with ancient Egypt's mummified dead is still bread, with starch and protein grains still in good chemical condition, Dr. Wanda K. Farr, of the Research Laboratories of the Celanese Corporation of America, told the American Association for the Advancement of Science.

Microscopic examination and chemical tests of the various parts of the wheat grains "show little physical deterioration beyond that caused by prolonged drying and the original grinding between stones in the preparation of flour," Dr. Farr reported. "Cell walls and starch grains in large numbers are intact, and even the fragments of those that are broken show no marked evidence of chemical deterioration. The bread compares in coarseness and color with modern cracked wheat bread."

Microscopic and microchemical examinations of fabrics found in Egyptian tombs also disclose a remarkable state of preservation. Fabrics found in Peruvian tombs were badly deteriorated.

Science News Letter, September 30, 1944

POPULATION

Thirty Million Homeless

Gigantic problem must be faced by the United Nations at close of hostilities. Not all will want to return to their old homes.

➤ THIRTY million homeless people forcibly tranpslanted by Nazi policies or by the necessities of war—these uprooted people pose a gigantic problem for the United Nations upon conclusion of hostilities.

Suggestions for the approach to solution of the problems are offered in a report by the National Planning Association under the direction of Clarence Pickett, of the Friends Service Committee.

The dispossessed people are by no means all Jewish refugees from religious or "racial" persecution. Some have fled from battle zones. Some were transplanted for labor in war industries or on farms. Some were moved for military service. Some are prisoners of war or have been interned by belligerent countries.

The numbers are the estimates of two groups: The Inter-Allied Committee on Post-War Requirements, known as the Leith-Ross Committee, and the International Labor Office. The two estimates, although both are necessarily rough, are in substantial agreement. The ILO estimate, prepared by Eugene M. Kulischer in consultation with the late Pierre Waelbroeck, has a total of 30 millions and includes some 10,000,000 people moved into Soviet territory. The Leith-Ross total is 21.5 million, but does not include the movement into USSR.

Neither estimate makes any attempt to include the movements of people which may be expected after the war when many groups will find themselves on the wrong side of new national frontiers.

Some of the recommendations of this report are:

Although the natural longing of an overwhelming majority of displaced persons to return home and reunite with their families should not be thwarted, neither should repatriation be dogmatically insisted upon. There will be some who like their new homes much better than the land from which they came, and who have been accepted by the people of the new location. Individual preferences in such cases should be given consideration.

Where absorption in the new location is both desired and feasible it should be made possible. A great many very desirable persons have come to the United States as refugees, for example; it would be unfortunate, the writers of the report believe, if such persons should be deported.

Some measures should be taken for the legal protection of those refugees who cannot, for one reason or another, be repatriated and who have not acquired another nationality. The problem of "stateless" persons—literally men without a country—demands the most careful consideration. Denationalization and denaturalization became a favorite weapon of totalitarian states against their political opponents after World War I, the report states.

The least that should be done for the stateless peoples, the report urges, would be the granting of a provisional identity document similar to the famous international "Nansen Passport." This should facilitate travel and return as well as work and residence.

The scope of both UNRRA and the Intergovernmental Committee should be extended to permit the expeditious handling of repatriation problems, and an unemployment service for displaced persons should be worked out, perhaps by the International Labor Office in consultation with both UNRRA and IGC, the report recommends.

Science News Letter, September 30, 1944

ASTRONOMY

New Comet Bright Enough To Be Seen Without Telescope

➤ THE COMET reported by a New Zealand astronomer was bright enough to have been seen with the naked eye by many soldiers in the Southwest Pacific. When discovered on September 13, the comet was of the fifth magnitude and therefore could be seen without the aid of a telescope.

The comet was spotted near the southern constellation of Volans, the flying fish, by D. C. Berry, director of the comet section of the New Zealand Astronomical Society. News of its discovery was forwarded from Carter Observatory at Wellington, New Zealand, to Harvard College Observatory, clearing house for American astronomical information.

The right ascension of the comet when found by Mr. Berry was seven hours, 40 minutes, and its declination negative 75 degrees. The comet, which had a short tail of one degree or less, was moving eastward at the rate of 22 minutes a day, and northward with a speed of three degrees, 12 minutes.

Science News Letter, September 30, 1944

One Operation Sterilizes And Separates Cream

➤ SEPARATING cream and sterilizing it are ordinarily conducted as separate processes. They are made parts of the same operation in a separator on which Peter W. Damon of Barton, Vt., has obtained patent 2,357,384. The inventor accomplishes this by introducing into the separator hood hollow steam spaces, suitably shaped to make close contact with the surfaces over which the milk and cream flow after they are separated.

Science News Letter, September 30, 1944

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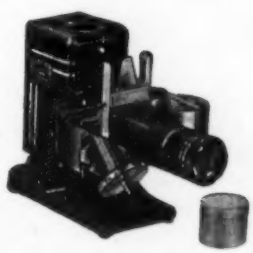

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SOCIOLOGY

Commission for Children

➤ ESTABLISHMENT of a commission for children and young people in the Office of War Mobilization was proposed by the Senate Subcommittee on Wartime Health and Education, of which Senator Claude Pepper, Fla., is chairman.

The proposal came as one of three recommendations to the Senate Committee on Education and Labor, following an investigation of the problem of juvenile delinquency.

Juvenile delinquency, the Pepper Committee found, does not have any single cause, such as working mothers or the demoralizing effect of higher family income. It is not war-born and has the same roots in peace and war. It cannot be cured by any single remedy.

Prevention is the soundest approach to the problem, the committee found from testimony of many witnesses with experience in child health and welfare. Many agencies are struggling with the problem, but overall leadership and coordination are needed, it was emphasized.

Although there are at least 12 agencies in the Federal Government alone which are performing special services for children, the services of none of them, from the Children's Bureau to the Federal Bureau of Investigation, can be spared, the committee reported. Nor is there any federal agency known to the committee which is set up in a way to provide the adequate leadership and coordination it finds is needed in the field of delinquency prevention.

Besides the recommendation for the commission for children and young people, the committee recommends that a central administrative authority arrange for fuller participation of children in home-front war activities and for a national publicity and educational policy to acquaint the people of the United States fully with facts about children and their basic needs.

Science News Letter, September 30, 1944

NUTRITION

Vitamin C From Trees

➤ THE CHIEF shop of a Soviet vitamin factory that produces the anti-scurvy vitamin C is situated in a woods which formerly attracted attention only from casual holiday-makers who came to pick wild nuts. In these Zakatalsk forests thick growths of nut trees spread over a distance of about 10,000 acres.

Nature has endowed these nuts, protected by a thick shell, with rare qualities which medicine has searched for in many fruits and plants. Both the flesh and the shell contain large quantities of vitamin C, an ascorbic acid as it is known chemically. Formerly the fruit of the wild rose was considered to have a larger content of this vitamin than any other plant growing in the U.S.S.R. Today unripe walnuts have taken first place in the table of raw materials containing vitamin C.

The vitamin C content of lemons, oranges and tangerines is between one-fortieth and one-fiftieth that of Zakatalsk nuts. During a short period in spring and summer the walnuts are saturated with the vitamin, which forms from 1.5 to 3% of the weight of the entire nut. The first experiments on these nuts were made in Azerbaijan before the war and now a large vitamin factory has been built there.

A concentrate of the vitamin from the nuts is prepared by a very simple process. The nut in which a cut has been made is washed in several waters during which it easily parts with the vitamin it contains. The only rule in this step is to keep a strict watch on the temperature and to make sure that the raw material is kept in a hermetically sealed vessel.

The juice obtained from the unripe nut, however, is unbearably bitter and this gave the greatest difficulty in making use of the walnut supply of vitamin C. The experimenters frequently gazed sadly at the bottles containing the scurvy-curing and preventing liquid which, however, could not be used in that form.

Then a second process was worked out by which this mistake of nature was corrected and soon a way was found by which the bitter juices of the nuts were refined and the taste changed to one more palatable.

This new sort of vitamin C is used chiefly in hospitals and military units.

Science News Letter, September 30, 1944

ORDNANCE

Handy Scooter Speeds Starting of Airplanes

➤ A SELF-propelled aircraft electric generator power plant mounted on a three-wheel gasoline scooter now speeds the starting of airplanes at the Municipal Airport, Wichita, Kans.

The scooter-generator, built by three civilian aircraft mechanics working with the AAF Materiel Command, can be driven over fields or to nearby auxiliary flying fields, or to any point on the grounds of a large airport, to be hooked into a plane and provide the necessary starting power. The new unit is especially useful in cold or inclement weather, and speeds the servicing of a large number of planes.

Science News Letter, September 30, 1944

From Mexico

These important books published in Mexico City are being stocked for your convenience by the Science Service Book Department.

THE NORTH OF MEXICO AND THE SOUTH OF THE UNITED STATES (EL NORTE DE MEXICO Y EL SUR DE ESTADOS UNIDOS). Proceedings of Third Round Table on Mexican and Central American Anthropological Problems held in 1943. Important and interesting articles, some in Spanish and some in English, on that area along both sides of the border that means so much to both countries. A must book for everyone interested in the past and present of Indians in both nations. 379 pages with 4 folding maps. $2.50 postpaid in U.S.A.

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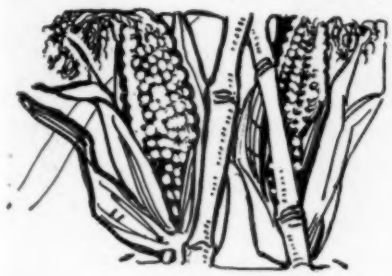
BIOGRAPHY

NATURE RAMBLINGS

by Frank Thone



Poor Richard: Farmer

➤ WE HEAR MUCH about the wise words and pioneering deeds of men like George Washington, Thomas Jefferson and Patrick Henry, in the field of early American agriculture. That is natural enough: Washington and Jefferson were owners and managers of big farms, and Henry was a country lawyer, often retained by farmers to do some of their worrying for them.

But we find Benjamin Franklin, city born and city bred, who went to the "big town" and made good as a businessman, nevertheless giving a good deal of highly intelligent attention to farm matters. Dr. Carl R. Woodward devotes a chapter to that less-known aspect of Franklin's life, in a recent symposium-book, *Meet Dr. Franklin.*

The first thing Dr. Woodward discovered about Franklin and farming was that, contrary to a long-accepted belief, Franklin never actually ran a farm. The belief is based on a letter about some very practical work done in field management on a farm in New Jersey, supposed to have been written by Franklin. It turns out that the writer (and owner of the farm in question) was Charles Read, a cousin of Franklin's wife.

However, despite the lack of any record of farm land ownership in New Jersey, Franklin did own a farm in Pennsylvania, not far outside Philadelphia. However, he never lived on it, and it is not at all certain that he ever did much about it. At any rate, this venture was no great success.

It was as a farm leader, as an agricultural publicist, that Franklin shone, rather than as an actual farmer. Dr. Woodward shows that he was a strong advocate of American corn as a paying crop, recommending it to prospective emigrants during his stays in England and Scotland. In this he differed from Washington and Jefferson, who thought rather ill of corn as a soil-wasting crop.

He was at one with them, however, in his eagerness to introduce into American agriculture the best of what he could find abroad. He sent home choice seed of oats, barley, turnips, cabbage, peas, rhubarb, kale and other plants. He was a strong advocate of legumes for green manuring, and is credited with a spectacular demonstration of the value of liming soils. Once he went to a great deal of trouble to send some cuttings of Rhenish grapes to an acquaintance in Connecticut, just because he wanted to see viticulture thrive there as well as in Pennsylvania.

Poor Richard may not have had much of a farm himself, but he undeniably did a great deal for American farming.

Science News Letter, September 30, 1944

● Just Off the Press ●

ELEMENTARY STATISTICS WITH GENERAL APPLICATIONS — Morris Myers Blair — *Holt,* 690 p., illus., $3.50.

OURSELVES UNBORN: An Embryologist's Essay on Man—George W. Corner—*Yale Univ. Press,* 188 p., illus., $3. The Terry Lectures.

THE READER OVER YOUR SHOULDER: A Handbook for Writers of English Prose—Robert Graves—*Macmillan,* 446 p., $3.

RIFLES AND MACHINE GUNS OF THE WORLD'S ARMIES—Melvin Maynard Johnson—*Infantry Journal,* 406 p., illus., paper, 25c. Fighting Forces Series.

SOCIAL AND EMOTIONAL ADJUSTMENTS OF REGULARLY PROMOTED AND NON-PROMOTED PUPILS — Adolph A. Sandin — *Teachers College*—Columbia Univ., 142 p., illus., $2.15.

SOCIAL PSYCHOLOGY — Kimball Young — *Crofts,* 578 p., $4.

THEY HOP AND CRAWL—Percy A. Morris—*Cattell,* 253 p., illus., $3.50.

THE WAR IN MAPS: An Atlas of the New York Times Maps—Francis Brown—*Oxford,* 167 p., illus., $2.

WE CANNOT ESCAPE HISTORY—John T. Whitaker—*Infantry Journal,* 345 p., paper, 25c. Fighting Forces Series.

INVENTION

New Method for Trapping Test Bullets Is Patented

➤ A NOVEL trap for flying bullets is offered by Irving R. Gilson of Liverpool, N. Y., for patent 2,356,992. It is intended to replace the sand traps commonly used as bullet stops where test firing is conducted.

Sand, the inventor points out, is a messy and unsatisfactory material to use for this purpose: it fills the air with silica flour that is a menace to workers' health, and also materially lowers the value of the spent bullets as scrap.

The new device consists of a long tube, into which jets of water are shot at an angle, forming a bubble-filled cushion the length of the pipe. When the bullets are fired into this they are slowed down and stopped without damage to themselves. The discharged water can be pumped back for re-use.

Science News Letter, September 30, 1944

WARD'S *Explano-Mounts*

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• Combining actual specimens, concise pertinent text and accurate explanatory drawings, Ward's Explano-Mounts insure correct observations on the part of students and save time by showing exactly what to look for, where to find it, and what it means. Two series now available: Type I, Insect Explano-Mount, deals with insects and the vital biological principles which are taught with insects or examples; Type II, Micro-Explano-Mount, on botanical and zoological subjects, incorporates a microscope slide.

Write for Bulletin N-397 which describes and lists 67 currently available Explano-Mounts.

WARD'S NATURAL SCIENCE ESTABLISHMENT, INC.
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•New Machines and Gadgets•

⚙ *MUZZLE velocities of missiles shot from American guns in proving ground tests are accurately obtained by shooting magnetized projectiles through two electric coils placed an accurately measured distance apart. A small electric signal is generated as each projectile passes through each coil.*

Science News Letter, September 30, 1944

⚙ *PAINTBRUSH cleaner consists of a frame with a flat surface against which the brush is held and a rotatable cylinder with teeth to comb the bristles in the brush. It is operated with a hand crank. The teeth, placed spirally in the cylinder, incline forwardly and are made of sharpened wire.*

Science News Letter, September 30, 1944

⚙ *ONE-MAN hay baler, drawn and operated by a tractor, scoops up the hay already raked into a windrow with a set of forward-projecting long teeth and bales it into a cylindrical bale which falls out of the machine in the rear. The bales are easily handled and stacked.*

Science News Letter, September 30, 1944

⚙ *ELECTRIC foot switches, used extensively in at least one large aircraft factory, control the operation of machines, leaving hands free for other purposes. The simple, dependable switch, operated by light toe pressure, is inside a metal housing, shown in the picture, that protects both it and the toes from falling objects.*

Science News Letter, September 30, 1944

⚙ *ROTARY shoe brushes driven by compressed air are in use in some shoe-shining parlors. These hand tools, operating like other familiar instruments worked by compressed air, are speedy and efficient. The compressed air is also used to dust shoes and clothes.*

Science News Letter, September 30, 1944

⚙ *TRUCK loading platform, built of wood or metal, enables trucks to be loaded or unloaded while standing parallel to the street curb. The sturdy, portable stand is pushed behind the truck during loading operations, and inside the building when not in use.*

Science News Letter, September 30, 1944

⚙ *SOCK STRETCHER and drier is made of three pieces of stamped-out composition board, or other rustproof, moisture-proof, non-bending material, which are hinged together with lacings. When folded the device is pocket-size.*

Science News Letter, September 30, 1944

If you want more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, 1719 N St., N. W., Washington 6, D. C., and ask for Gadget Bulletin 227.

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